Climate Safe Infrastructure Working Group

Meeting #2

Los Angeles City Hall

200 N. Spring Street, Room 1050

Los Angeles, CA 90012
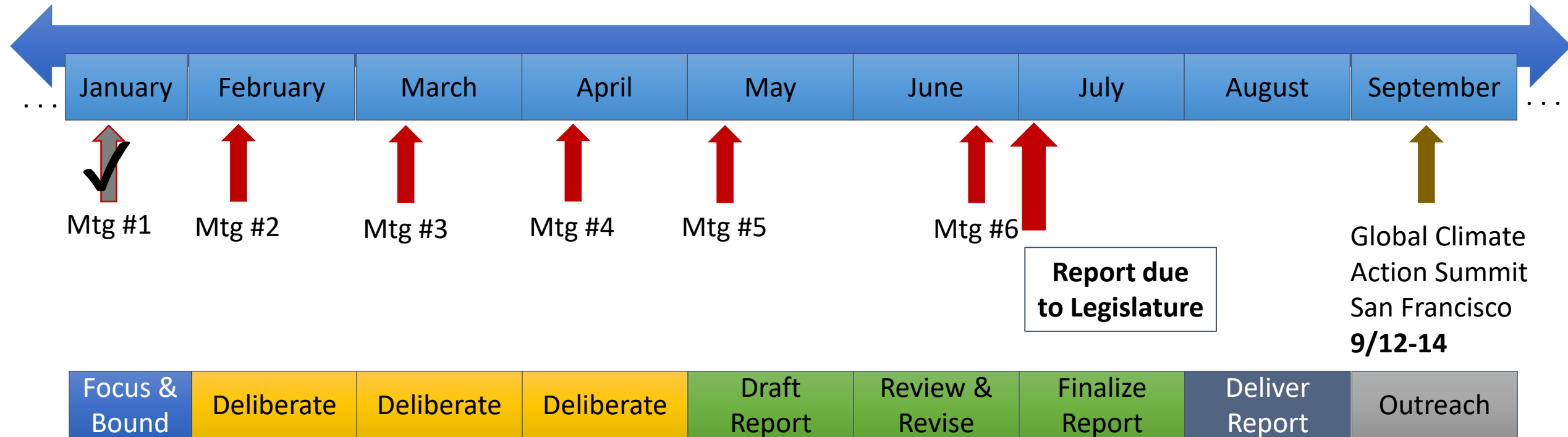
Monday, February 12, 2018

10am – 4pm

Agenda

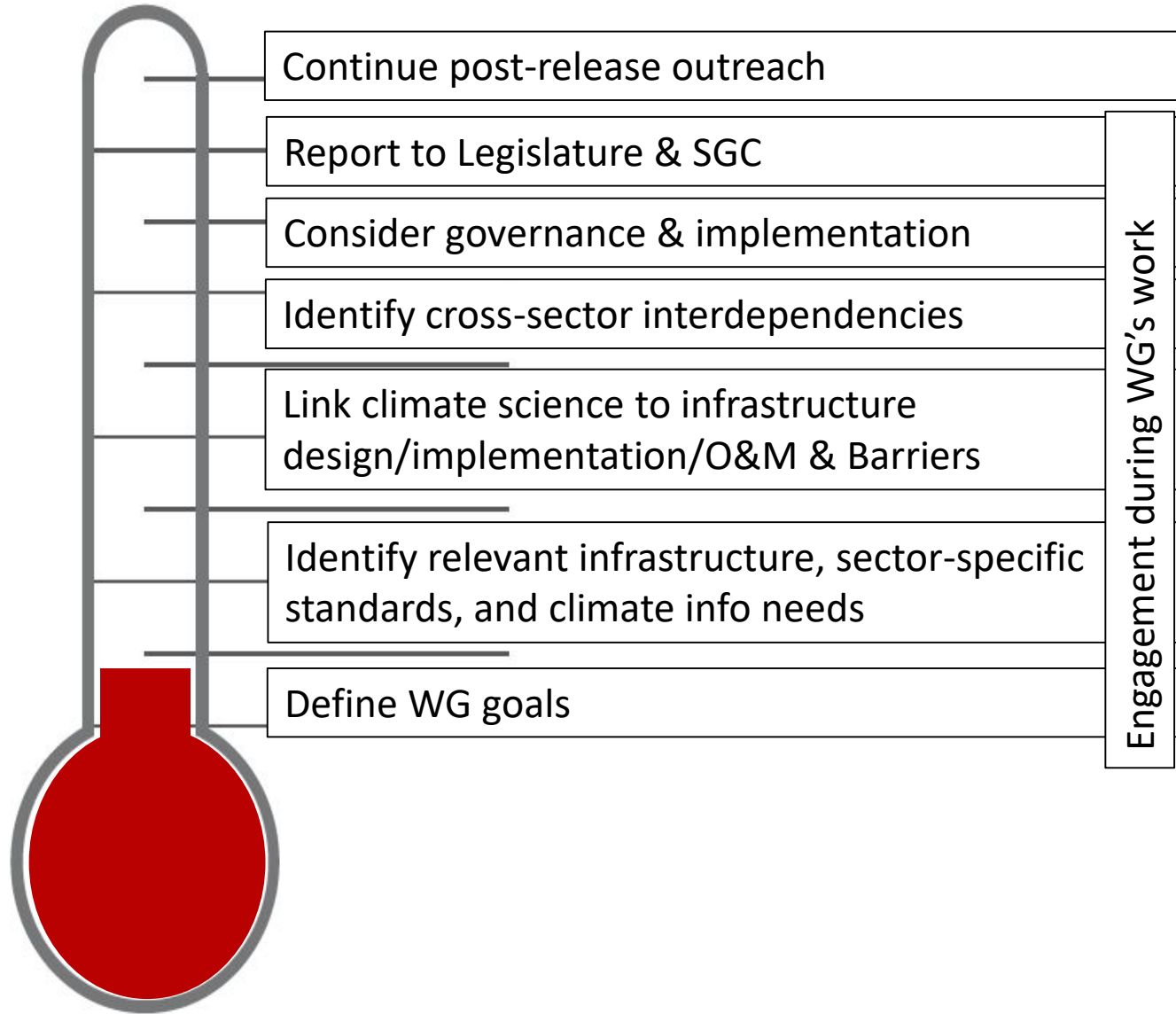| Time	Agenda Item
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12:00-12:30	Regional Example: Build Forward Los Angeles
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2:30-3:30	Identification of climate science needs
3:30-4:00	Outlook and trajectory to Mtg. #3
4:00	Adjourn

Project Timeline

January | February | March | April | May | June | July | August | September

Mtg #1 | Mtg #2 | Mtg #3 | Mtg #4 | Mtg #5 | Mtg #6

Report due to Legislature

Global Climate Action Summit San Francisco **9/12-14**

| Focus & Bound | Deliberate | Deliberate | Deliberate | Draft Report | Review & Revise | Finalize Report | Deliver Report | Outreach |

Meeting Dates, Locations, Topics & Tasks

Mtg	Dates	Locations	Topics and Tasks
~~1~~	~~1/18~~	~~Sacramento~~	~~Determine project goals; WG structure and process~~
2	**2/12**	**Los Angeles**	**Identify relevant infrastructure, sector-specific infrastructure standards, climate-sensitivity, information needs**
3	3/13	Bay Area	Linking forward-looking climate science and impacts information with standards, codes, certifications throughout infrastructure design/implementation/ maintenance cycle
4	4/11	Sacramento	Sector-specific design standards and cross-sector interdependencies
5	5/9	San Diego	Governance of setting/changing design standards; non-standard strategies to ensure climate-safe infrastructure; deliberation of draft report; agree on refinement needs
6	6/20	Sacramento	Agree on final report revisions; delivery and outreach/promotion; project debrief

Measuring progress

Continue post-release outreach

Report to Legislature & SGC

Consider governance & implementation

Identify cross-sector interdependencies

Link climate science to infrastructure design/implementation/O&M & Barriers

Identify relevant infrastructure, sector-specific standards, and climate info needs

Define WG goals

Engagement during WG's work

Co-Development of Project Goals & Objectives

Photos: Susi Moser, CSIWG members clustering goals at Meeting #1

Synthesis of Goals Identified in Meeting #1

Overarching Goals (with numerous sub-objectives each)
Orient toward longer-term outcomes (Vision, indications of success)
Produce a set of outputs by July 1
Provide clear policy guidance for near-term and longer-term decisions
Address key issues for science & the science-practice interface
Focus on engagement during and after the life of the Working Group
Embody a set of principles and values throughout the Working Group's work

The Arc of Our Work

Meeting 1
- Goal setting
- Rules of engagement

Meeting 2
- **Identify, prioritize climate-sensitive infrastructure;**
- **Agree on definitions**
- **Prioritize relevant standards, codes, guidelines;**
- **Identify information needs**

Meeting 3
- Connect engineers' information needs with climate science;
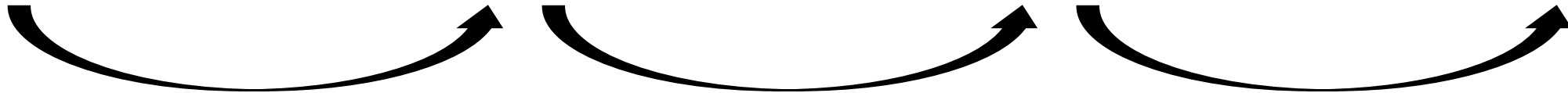- Identify barriers to information use
- Work through concrete examples

Meeting 4
- Refine information needs when considering cross-sector interdependencies
- Refine prioritization
- Consider comprehensive approaches to climate-safe infrastructure

Charge for Meeting #2:

- **Task 1**: Identify types of climate-sensitive infrastructure

- **Task 2**: Begin exploring questions of prioritization of updating infrastructure design guidelines and standards

- **Task 3**: Agree on definitions for resilience and climate-safe infrastructure in sector-specific and holistic ways

- **Task 4**: Identify opportunities for ensuring that infrastructure is rendered or built in resilient, climate-safe ways

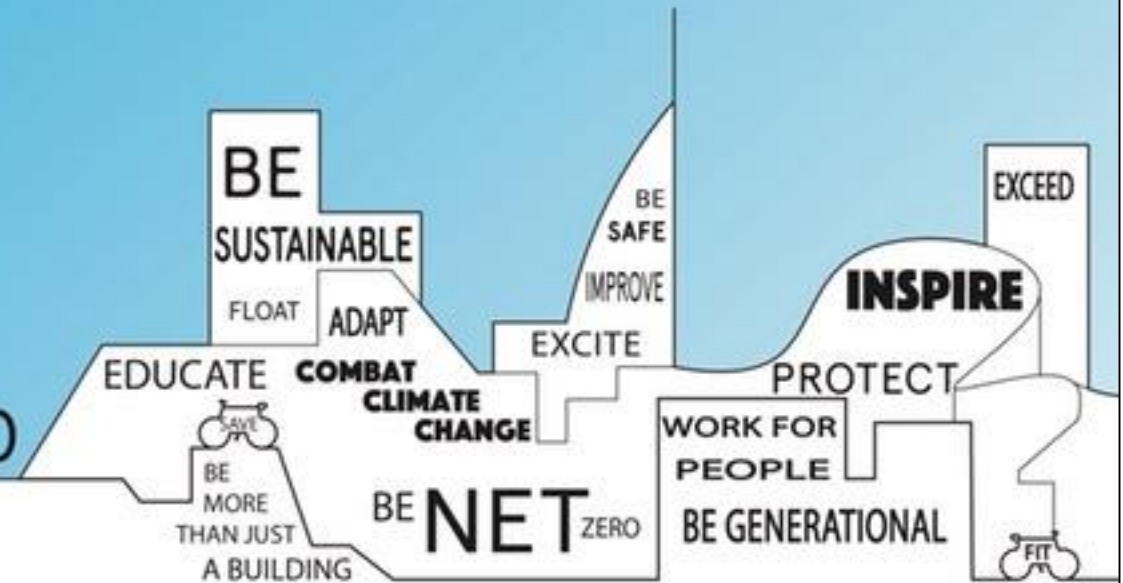- **Task 5**: Identify climate information needs for use in infrastructure planning and engineering

Regional Example

- Sabrina Bornstein, Deputy Chief Resilience Officer | City of Los Angeles
- Matt Barnard, Principal | Degenkolb Engineers

Agenda

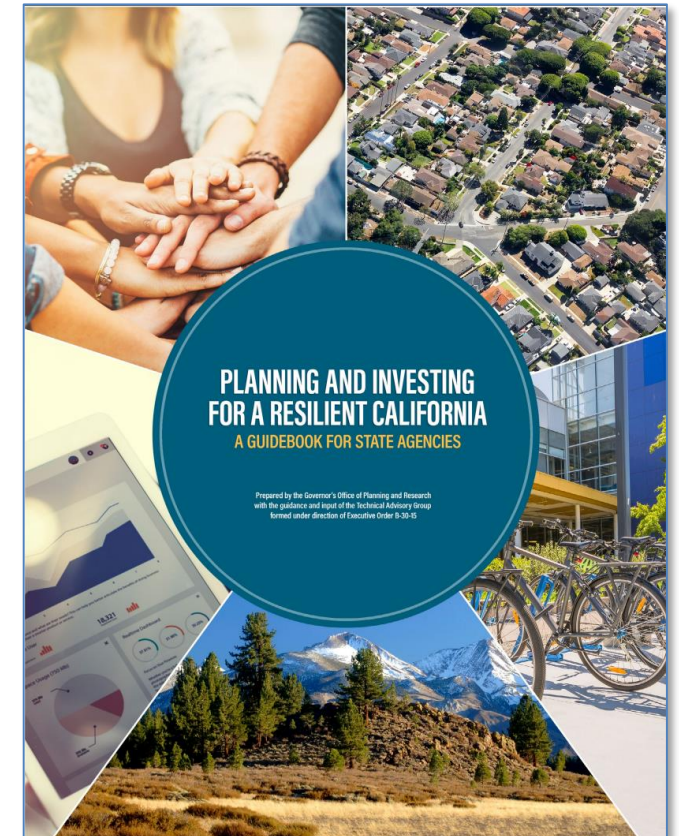| Time	Agenda Item
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Agree on Definitions

- (Critical) Infrastructure

- Resilience

- Climate-Safe
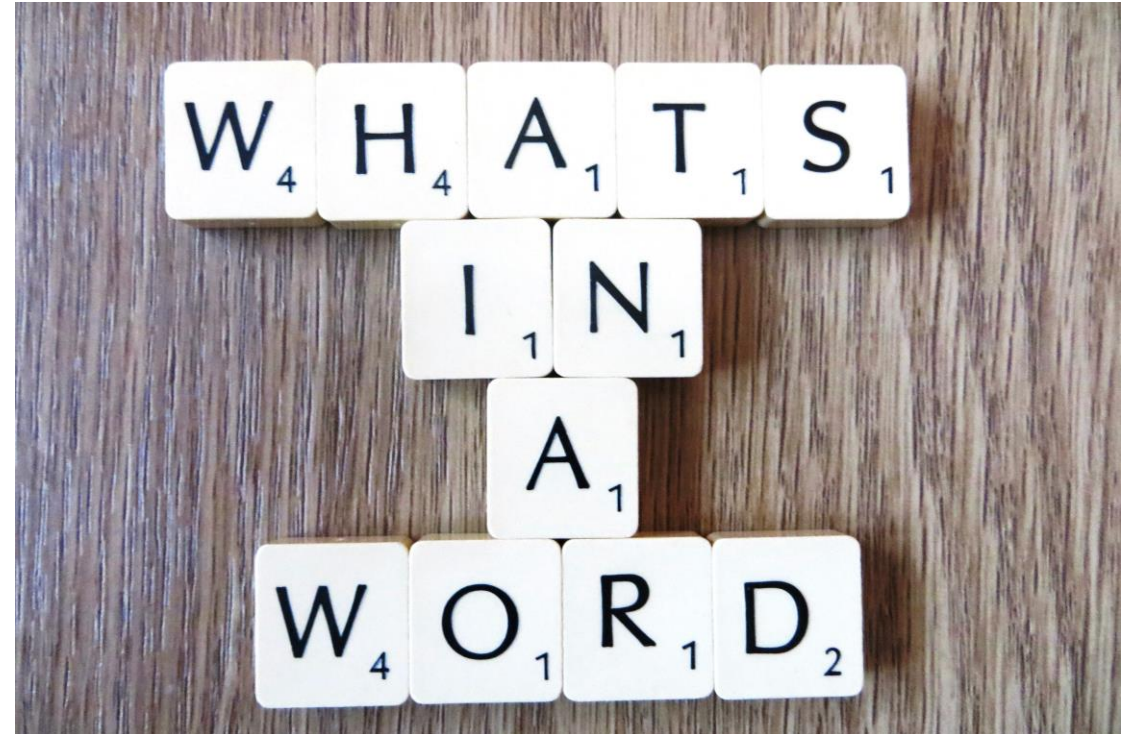
Resilient CA Guidance: "Infrastructure"

Assets that support the functioning of society or whose operation and maintenance are necessary for the public's health, safety, and welfare. These assets can be natural or man-made, as well as physical or virtual, and can be held publicly or privately.

The benefits from these assets are generally available to a large portion of the population, because they are held in public trust, or because their adoption is so widespread that social processes have become reliant on them.

PLANNING AND INVESTING FOR A RESILIENT CALIFORNIA
A GUIDEBOOK FOR STATE AGENCIES

Prepared by the Governor's Office of Planning and Research with the guidance and input of the Technical Advisory Group formed under direction of Executive Order B-30-15

http://opr.ca.gov/docs/20171117-Building_a_Resilient_CA.pdf

ASCE: "Critical Infrastructure"

Critical infrastructure includes <u>systems, facilities, and assets</u> so vital that their <u>destruction or incapacitation</u> would have a <u>debilitating impact on national security, the economy or public health, safety, and welfare</u>.

Critical infrastructure may cross political boundaries and may be <u>built</u> (such as structural, energy, water, transportation, and communication systems), <u>natural</u> (such as surface or ground water resources), or <u>virtual</u> (such as cyber, electronic data, and information systems).

Source: Policy Statement 518 – Unified Definitions for Critical Resilience Infrastructure

Identify Climate-Sensitive Infrastructure by Sector

| Infrastructure type	Existing condition / status	Exposure to existing climate stresses	Perceived/expected changes in climate stressors
E.g., Transportation – Culvert Design	205,000 culverts on State Hwys, 65% in Good Condition, 23% in Fair Condition, and 12% in Poor Condition	Exposed to scour from coastal storms; potential for tidal flooding...	E.g., Increased exposure to coastal storms, erosion and rising seas...

Small Group Work:

- Group up into sectors (water, transportation, energy, buildings)
- Develop draft master list of infrastructure by sector
- Discuss current exposure and expected changes
- Report back to group

Opportunity for Public Comment

Prioritization: Initial Considerations

- Need/state of good repair/status according to "deferred maintenance" list

- Exposure or vulnerability to climate change risks

- Capacity to fund

- Social equity

- Importance to local community/regional/state functioning (i.e., economics)

- Others?
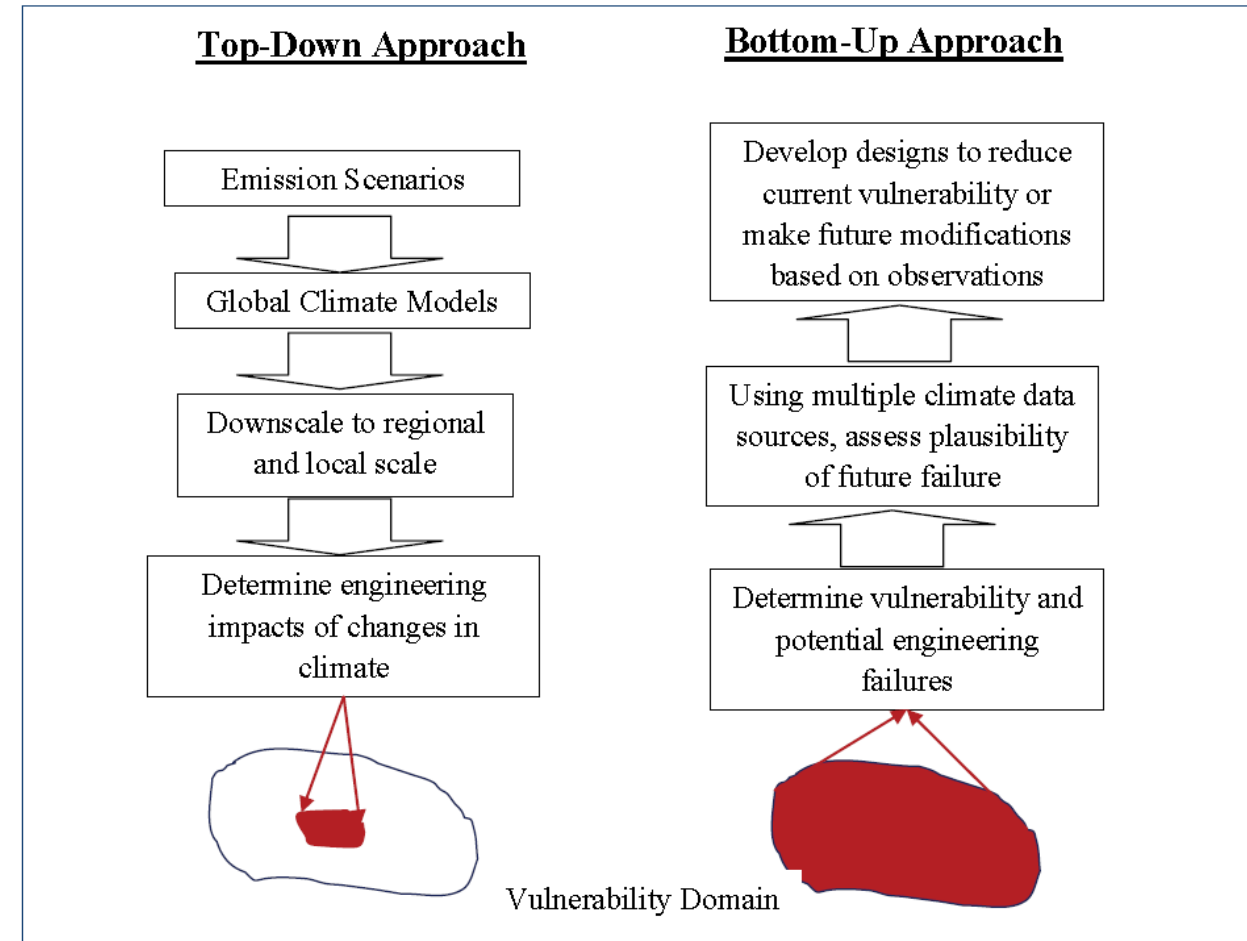
(ASCE 2015, p.21)

Which Infrastructure Do We Prioritize?

- What are the criteria for prioritizing infrastructure? Why?
    - Sector-specific
    - Holistic/system-wide

- What is most important to focus on? Why?
    - Sector-specific
    - Holistic /system-wide

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Ecological Resilience

The amount of disturbance that an ecosystem can withstand without changing self-organized relationships, processes and structures (i.e. alternative stable states).

(Gunderson, 2000, based on C.S. Holling)
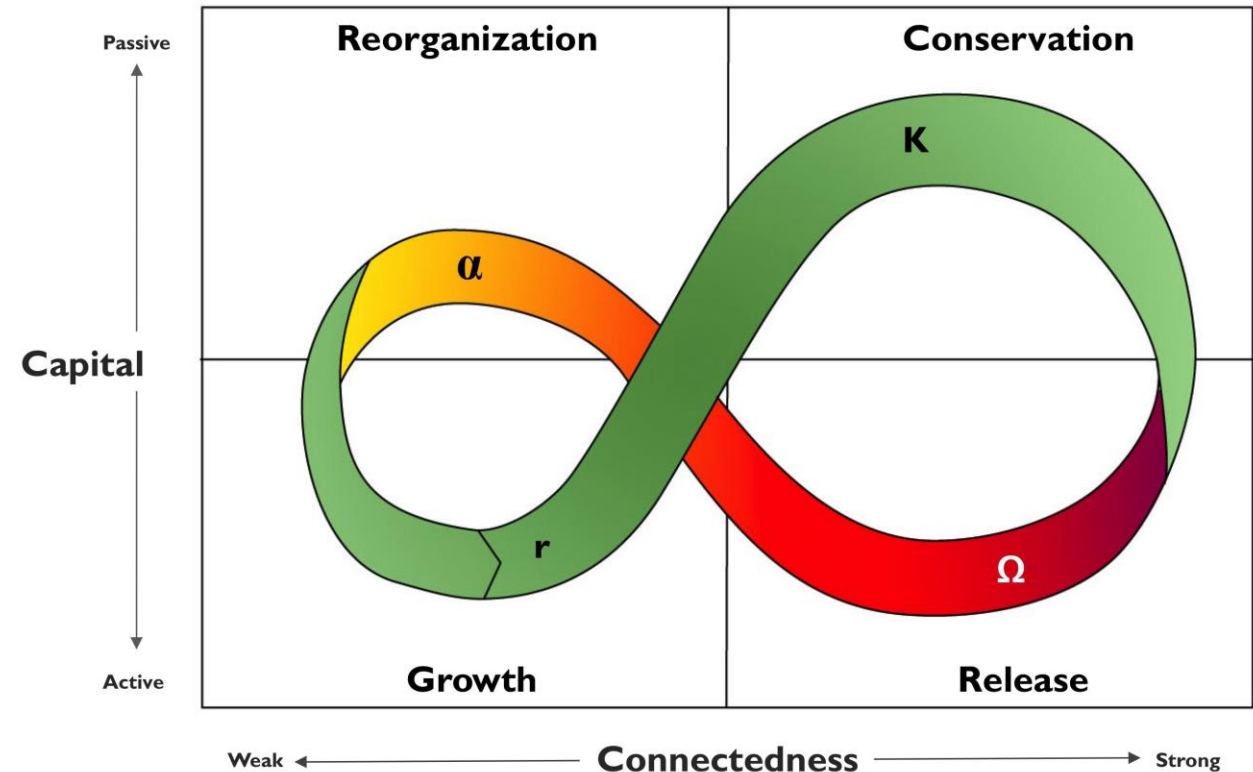
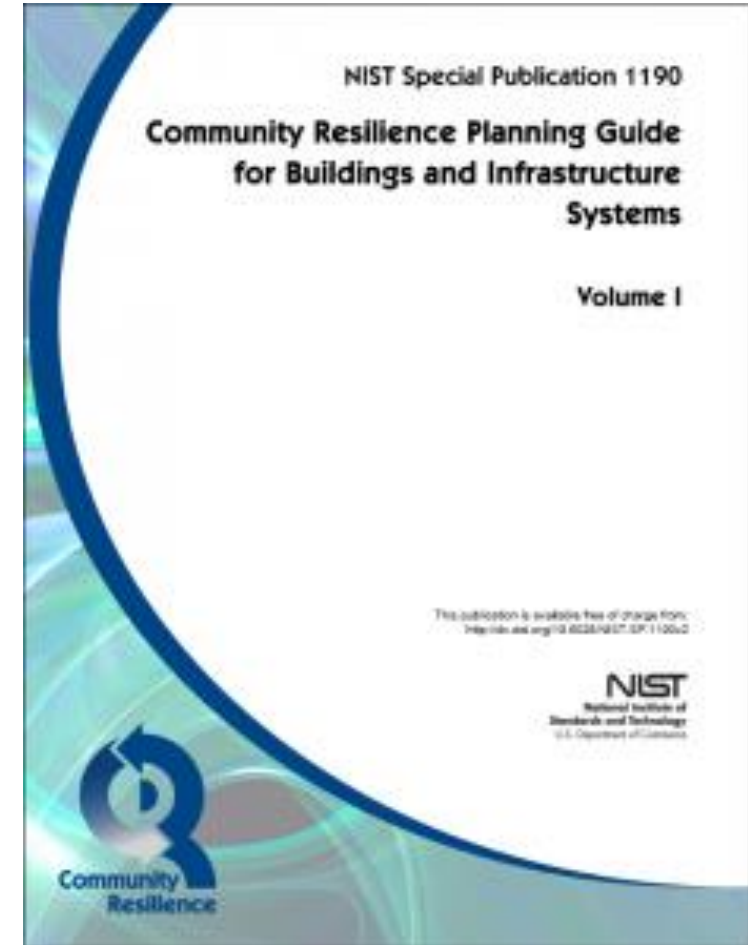# Safeguarding California (2018):"Resilience"

Resilience is the <u>capacity</u> of any entity – an individual, a community, an organization, or a natural system – to <u>prepare</u> for disruptions, to <u>recover</u> from shocks and stresses, and to <u>adapt</u> and <u>grow</u> from a disruptive experience

Definition also used in OPC's Sea Level Rise Policy Guidance (Draft, 2018)

Safeguarding California Plan: 2018 Update

California's Climate Adaptation Strategy | January 2018
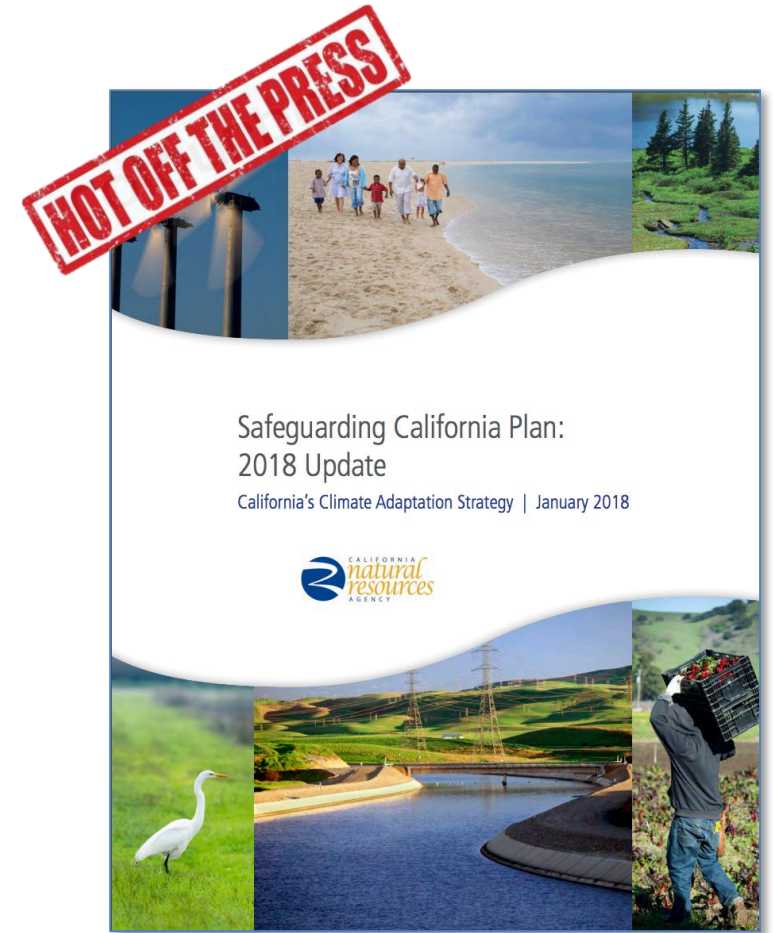
NIST: "Community Resilience"

Community resilience is the ability to prepare for anticipated hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

NIST Special Publication 1190

Community Resilience Planning Guide for Buildings and Infrastructure Systems

Volume I

American Association of State Highway and Transportation Officials
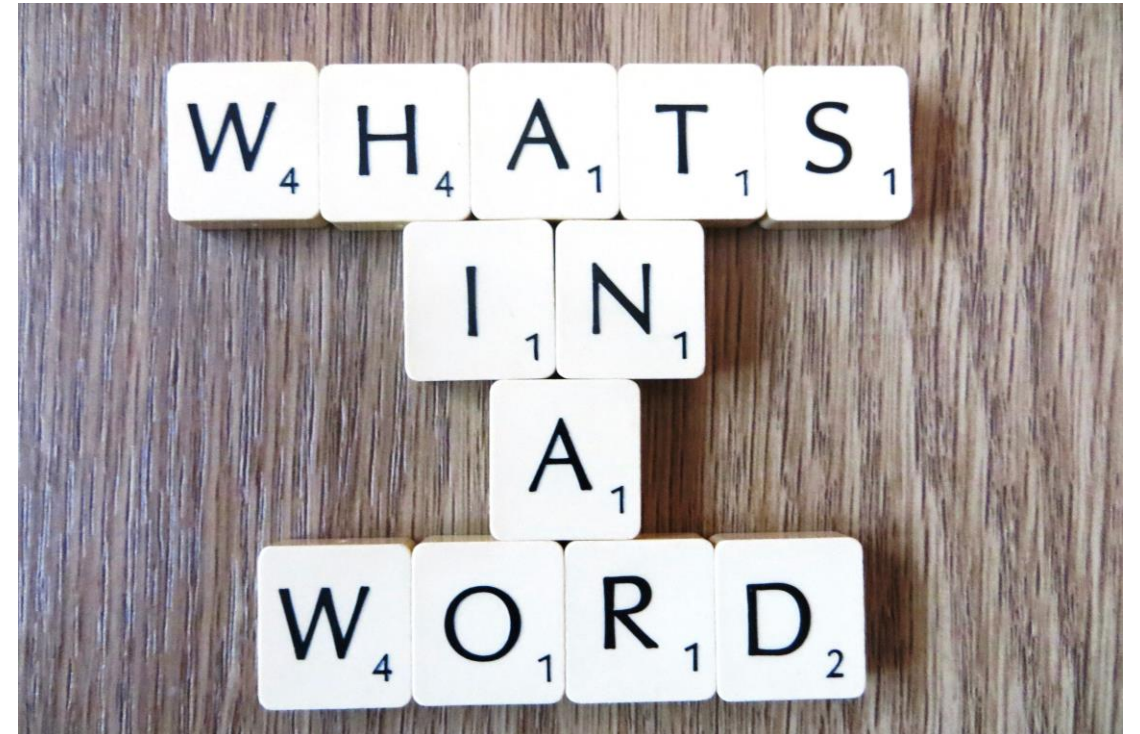
The ability to <u>prepare</u> and <u>plan</u> for, <u>absorb</u>, <u>recover</u> from, or more <u>successfully</u> <u>adapt</u> to adverse event.

http://www.dot.ca.gov/transplanning/ocp/docs/D4_Caltrans_Vulnerability_Assessment_v49.pdf

Agree on Definitions

- (Critical) Infrastructure

- Resilience

- Climate-Safe

Climate-Safe Infrastructure

All people and communities respond to changing average conditions, shocks, and stresses in a manner that minimizes risks to public health, safety, and economic disruption and maximizes equity and protection of the most vulnerable.

Natural systems adjust and maintain functioning ecosystems in the face of change.

Infrastructure and built systems withstand changing conditions and shocks, including changes in climate, while continuing to provide essential services.

Government managers take climate change adaptation into account in all aspects of their work.*

Source: Safeguarding 2018 Update

- Can "safety" be defined within any one sector?

- Or does it need to be holistically climate-safe?

- How do you know it's actually safe?

Adaptive, Resilient & Climate-Safe?

Small Group Discussion

- Are existing definitions of resilience good enough?

- What are essential elements of climate-safety you want to see included in the WG's definition?

Report Back & Discussion

Opportunity for Public Comment

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Building Forward Los Angeles

Sabrina Bornstein
Deputy Chief Resilience Officer
Office of Mayor Eric Garcetti
City of Los Angeles

Matt Barnard
Principal
Degenkolb Engineers

BUILDING FORWARD LA

LUNCH @ Señor Fish
155 S. Main St, LA 90012
12:30 – 1:30pm

- Mull over definitions, infrastructure types identified & how to Prioritize
- What can we learn From BFLA

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Agreed Definitions

- (Critical) Infrastructure
  - [to fill in following discussion]

- Resilience
  - [to fill in following discussion]

- Climate-Safe
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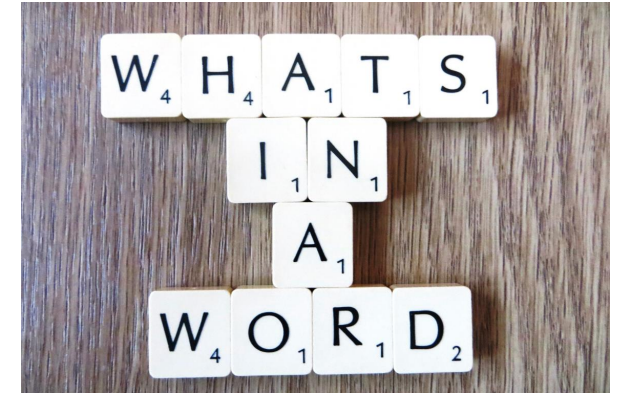
Identifying Infrastructure Standards & Guidelines

Sector-specific infrastructure regulations, standards/codes and/or guidelines

Caltrans Highway Design Manual (HDM), FHWA Hydraulic Design of Highway Culverts (HDS-5), FHWA Urban Drainage Design Manual (HEC-22)…

Small Group Work:

- Discuss guidelines, procedures, standards, codes for existing/replaced/new/green infrastructure throughout the infrastructure planning and building process

- To what extent are existing guidelines sufficient to create resilient/climate safe infrastructure / communities?

- Which need to change to support building climate-safe, adaptive, resilient infrastructure systems?

Report Back & Discussion

Making Infrastructure Climate-Safe

- Existing infrastructure retrofits

- Replacing damaged infrastructure

- Building new infrastructure

- Green infrastructure

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Identifying Information Needs

Information used in current planning, design, decision-making	Forward-looking information needs
NOAA Atlas 14 precipitation data (based on historical rainfall data), land use (based on stable historical conditions), Material selection, return frequency, Design Life	How fast SLR will impact culvert; rates of coastal erosion; change in return interval of storms, temperature and precipitation increases over regions of State for various lifecycles of culverts…

Small Group Work:

- Identify current info used

- Identify forward-looking info needs

- Focus on the standards and guidelines previously prioritized
  - Existing infrastructure retrofits
  - Replacing damaged infrastructure
  - Building new infrastructure
  - Green infrastructure

Report Back & Discussion

Useful examples to work through in meeting #3?

Opportunity for Public Comment

Review of the Day

IDENTIFIED INFRASTRUCTURE

BEGAN PRIORITIZATION OF INFRASTRUCTURE

DEFINED RESILIENCE & CLIMATE-SAFE INFRASTRUCTURE

ID'ED RELEVANT STANDARDS & GUIDELINES

ID'ED CLIMATE INFO NEEDS

NEXT STEPS

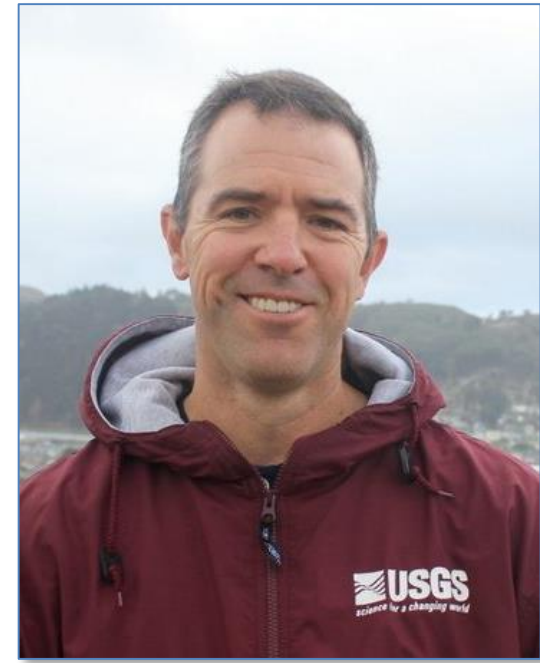# Next Webinar – 2/22 at 12pm – 1pm PST

Forward-Looking Climate Science for Use in Infrastructure Engineering: Possibilities and Limits

Dan Cayan, Ph.D.
CSIWG Member

Claudia Tiebaldi, Ph.D.
NCAR

Patrick Barnard, Ph.D.
USGS

Next Steps

We Will

- Continue webinar series
- Prepare meeting summary notes
- Prepare Meeting #3 (San Francisco)
- [to be added over the course of the CSIWG meeting]
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You Will

- Make travel arrangements for SF meeting
- Prepare for next meeting; homework to be sent
- [to be added over the course of the CSIWG meeting]
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Be in touch!

- To sign up to the Climate-Safe Infrastructure listserve...
- To stay up to date on CSIWG developments...
- To ask questions or send comments...

> Email: Elea Becker-Lowe at Elea.Beckerlowe@resources.ca.gov or at climatesafeinfrastructure@resources.ca.gov

... and she will direct the inquiry accordingly.

Meeting #2 of the Climate-Safe Infrastructure Working Group • Los Angeles • February 12, 2018

Toward Climate-Safe Infrastructure

Thank you!